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July 17, 2006

SHAW-MC-CK10-1005
Project No. 796887

Mr. Lee Coker
U.S. Army Corps of Engineers, Mobile District
Attn: EN-GE/Lee Coker
109 St. Joseph Street
Mobile, Alabama 36602

**Contract: DACA21-96-D-0018, Task Order CK10
Fort McClellan, Alabama**

**Subject: Final Site Investigation Report and Decision Document for AWWSB
Tank Sites Near Baby Bains Gap Road Ranges**

Dear Mr. Coker:

The enclosed letter report and decision document summarize the site investigation (SI) conducted by Shaw at two future Anniston Water Works and Sewer Board (AWWSB) tank sites located near the Baby Bains Gap Road Ranges at Fort McClellan, Alabama. The investigation was conducted to facilitate transfer of these properties from the Army to the Anniston-Calhoun County Fort McClellan Development Joint Powers Authority.

This SI report was previously issued in October 2005; however, minor changes were made to the document in response to ADEM comments received on February 6, 2006. EPA concurred with the previous version of the report. Shaw's response to ADEM comments and EPA's concurrence letter are included in the SI report. Please file these documents in your records and provide a letter of concurrence.

At your request, I have distributed copies of this submittal as indicated below. If you have questions, or need further information, please contact me at (865) 694-7361.

Sincerely,

A handwritten signature in cursive script that reads "Stephen G. Moran".

Stephen G. Moran, P.G.
Project Manager

Attachments

Distribution: Lisa Holstein, FTMC (6 copies; 2 CDs)
Brandi Little, ADEM (2 copies; 1 CD)
Doyle Brittain, EPA Region 4 (1 copy; 1 CD)
Miki Schneider, JPA (1 copy)
Michelle Beekman, Matrix Environmental (1 copy)

1.0 Introduction

The Baby Bains Gap Road (BBGR) Ranges are comprised of eight sites that lie nearly adjacent to each other in the central section of the Fort McClellan (FTMC) Main Post: Range 20, Range 25, Range 28, Former Range 25 East, Range 23, Range 26, the Ranges South of Range 25, and Range 18. The Anniston Water Works and Sewer Board (AWWSB) tank sites (the Snap Lane Tank Site and the Bains Gap Road Tank Site) are located adjacent to former Range 23 and former Range 25, respectively (Figure 1). Range 23 and Range 25 were small-arms ranges that were previously investigated by Shaw during a remedial investigation (RI) (Shaw Environmental, Inc. [Shaw], 2004). However, the tank sites are located outside the RI area of investigation and no samples were collected during the RI. Therefore, investigation of these areas was required prior to property transfer.

Based on the results of the RI, the primary environmental concern at the BBGR Ranges is the prevalence of lead and copper contamination in surface soil. The source of contamination is bullets and bullet fragments from weapons training.

2.0 Purpose and Scope

The purpose of this investigation was to determine the presence or absence of lead- and copper-contaminated soils within the two AWWSB tank site boundaries. Prior to performing the field work, a site-specific work plan was prepared detailing the field activities to be performed, including x-ray fluorescence (XRF) survey and confirmation soil sampling and analysis (Shaw, 2005). The work plan, which consisted of a sampling and analysis plan (SAP), a safety and health plan, and an unexploded ordnance (UXO) safety plan, was used in conjunction with FTMC installation-wide work plan (IT Corporation [IT], 2002a; 1998), and the SAP (IT, 2002b; 2000a).

3.0 Site Descriptions and History

Range 23. Range 23 was used from 1951 until Base closure. Weapons fired at this range included the M-16 automatic rifle and M-16 with tracer. The *Environmental Baseline Survey* (EBS) reports evidence of artillery ordnance impact at Range 23, as Base personnel have found shell fragments and an unexploded mortar round in the area (Environmental Science and Engineering, Inc. [ESE], 1998). According to the *Archives Search Report* (ASR), Range 23

(OA-41) was originally a pistol range and later became a rifle and machine gun range, with multiple orientations and layouts used during the period between World War I and World War II (USACE, 2001). Further, the ASR reports that a part of this area was used in Combat Range #1 (OA-43).

The AWWSB tank site is located along Snap Lane, adjacent to the southwest corner of the Range 23 RI study area (Figure 1). The tank site covers approximately 5.8 acres.

Range 25. Range 25 is one of the oldest and most used ranges at FTMC and may have been in use as early as the 1920s. Long-time FTMC personnel believe that Range 25 was constructed as a 600-yard known-distance range for training using M-1903 Springfield rifles (.30 caliber) and M-1 Garand rifles (.30 caliber). This range was also reportedly used as a machine gun range. FTMC Range Control records indicate that the range was used for M-14 training. The EBS states that weapons fired at this range consisted of various small arms, including the M-14, M-16, M-1, and M-60 (with tracers) rifles (ESE, 1998). The firing direction was to the northeast.

The AWWSB tank site is located along Bains Gap Road, adjacent to the eastern boundary of the Range 25 RI study area (Figure 1). The tank site covers approximately 6.1 acres.

4.0 Field Investigation Activities

This section describes the field activities performed during the investigation of the AWWSB tank sites, including UXO avoidance, site surveying and establishment of sampling grids, XRF soil screening, and confirmation sampling and analysis.

UXO Avoidance. Prior to performing any intrusive field work, UXO avoidance was performed within the areas to be investigated following methodology outlined in the UXO Safety Plan and the SAP. Shaw UXO personnel used a hand-held magnetometer to perform a surface sweep of the areas of investigation prior to site access. After the sites were cleared for access, sample locations were monitored by UXO personnel following procedures outlined in the SAP.

Site Surveying and Establishment of Sampling Grids. Prior to sampling, a registered land surveyor surveyed the boundaries of the AWWSB tank sites. Sampling grids, consisting of 100-foot grid squares, were established over the entire area of the AWWSB tank sites, as shown on Figures 2 and 3. The intersecting points of the grid, or nodes, were marked using wooden stakes and then surveyed. The grid nodes were assigned unique identifiers based on the distance

(in feet) and direction from a reference node (e.g., NW0, SW0) used as the starting point. For example, the location “N100, W200” refers to a point 100 feet north of and 200 feet west of the starting point. The grid node designations and survey coordinates are provided in Table 1.

XRF Sampling and Analysis. During the initial phase of the investigation, metals analysis was performed at the grid node locations using a portable XRF instrument. The XRF samples were analyzed for lead and copper. At the Bains Gap Road Tank Site, 34 XRF samples were analyzed (Figure 2). At the Snap Lane Tank Site, 30 XRF samples were analyzed (Figure 3). The XRF soil samples were assigned unique sample identifiers based on the grid system.

A Niton 733 portable XRF instrument was used to perform the analyses, following procedures described in the FTMC SAP. The instrument was calibrated daily using a blank and certified standard reference materials of known concentrations. The XRF calibration forms are included in Appendix A.

At each grid node, a sample was collected from the upper 3 inches of soil using a steel sampling trowel and placed in a disposable aluminum foil pan. Prior to analysis, any rocks, vegetative matter, bullets, shot, or bullet fragments were removed and the sample was homogenized. Once homogenized, the soil was analyzed directly in the pan using the XRF. Data from the analysis were automatically stored in the instrument data logger, downloaded to a laptop computer at the end of each day, and transferred into an Excel[™] spreadsheet for subsequent data management and reporting. In addition, the results were recorded by the analyst on the XRF Summary of Results form (Appendix A).

Off-Site Confirmation Analysis. Seven of the 64 XRF-analyzed samples (11 percent) were sent to EMAX Laboratories, Inc. (EMAX) for confirmation metals analysis using EPA Method 6010B (Table 2). Prior to shipment to the off-site laboratory, the confirmation samples were prepared by heating at 120 degrees Celsius for approximately 4 hours or until dry, crushing with a decontaminated ceramic mortar and pestle, and passing through a standard #10 sieve (2 millimeter pore size). The prepared soil was then analyzed using XRF before being placed in a glass sample container, appropriately labeled, and sealed.

Sample Documentation, Custody, and Tracking. Sample documentation, custody, and tracking followed the procedures described in the FTMC SAP. Collection of the XRF field samples was documented on the sampling forms (Appendix A). Sample custody was maintained

at all times by the XRF analyst prior to shipment to EMAX. The sample collection logs and chain-of-custody records for the confirmation samples are included in Appendix B.

Data Management and Validation. The confirmation sample data were validated in accordance with EPA National Functional Guidelines by Level III criteria. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. The validation-assigned qualifiers were added to the ShawView™ database for tracking and reporting. A summary of validated analytical data is provided in Appendix C.

5.0 Summary of Analytical Results

The XRF and confirmation sample results are summarized in Tables 3 and 4, respectively. Detectable lead concentrations using XRF ranged from 15 to 65.3 milligrams per kilograms (mg/kg); all XRF results for copper were below instrument detection limits (Table 3). As shown in Table 4, the XRF results showed excellent correlation with the confirmation results. Calculated relative-percent differences for lead between the prepared XRF samples and the confirmation samples were less than 15 percent, except at one location (Snap [N100, W200]). At this location, the laboratory result (84.5 mg/kg) was higher than either the field XRF result (29.1 mg/kg) or the prepared XRF sample result (19 mg/kg). This difference is attributable to the heterogeneity of the soil matrix and variations in the sensitivities of the analytical methods.

To evaluate the presence or absence of contamination, the analytical results were compared to human health site-specific screening levels (SSSL) and ecological screening values (ESV) for FTMC (IT, 2000b). The SSSLs and ESVs were developed as part of human health and ecological risk evaluations associated with investigations performed under the Base Realignment and Closure (BRAC) Environmental Restoration Program at FTMC. Additionally, metals concentrations exceeding SSSLs and ESVs were compared to background screening values (Science Applications International Corporation, 1998) to determine if the metals concentrations are within naturally occurring background levels.

Bains Gap Road Tank Site. All XRF and confirmation sample results for copper and lead were well below residential SSSLs (313 mg/kg and 400 mg/kg, respectively) and industrial SSSLs (2,040 mg/kg and 880 mg/kg, respectively). The lead results at two locations marginally exceeded the ESV (50 mg/kg) and also exceeded the background value (40 mg/kg):

Sample Location	XRF Lead Result (mg/kg)	Lab Lead Result (mg/kg)
NW800, SW300	57.2	82.6
NW200, SW200	41.5	59.7

All XRF results for copper were below instrument detection limits, although the detection limits (37 to 65 mg/kg) were typically above the ESV (40 mg/kg) and background value (12.7 mg/kg) for copper. However, all confirmation sample results for copper were below the ESV and background (Table 4).

Snap Lane Tank Site. All XRF and confirmation sample results for copper and lead were well below residential SSSLs (313 mg/kg and 400 mg/kg, respectively) and industrial SSSLs (2,040 mg/kg and 880 mg/kg, respectively). The lead results at three locations marginally exceeded the ESV (50 mg/kg) and also exceeded the background value (40 mg/kg):

Sample Location	XRF Lead Result (mg/kg)	Lab Lead Result (mg/kg)
N500, W300	65.3	81.8
N200, W300	55	NA
N300, W100	51.6	NA

NA – Not available; confirmation sample not collected at this location.

All XRF results for copper were below instrument detection limits (44 to 63.6 mg/kg), although the detection limits were typically above the ESV (40 mg/kg) and background value (12.7 mg/kg) for copper. However, all confirmation sample results for copper were below the ESV and background (Table 4).

6.0 Conclusions

Based on the XRF and confirmation sample results, historical range activities at the BBGR Ranges 23 and 25 have not adversely impacted soil at the AWWSB tank sites. Therefore, Shaw believes that these sites are suitable for property transfer without restrictions regarding hazardous substances regulated under the Comprehensive Environmental Restoration, Compensation, and Liability Act.

7.0 References

Environmental Science and Engineering, Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for the U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

IT Corporation, 2002a, *Draft Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama*, Revision 3, February.

IT Corporation, 2002b, *Draft Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, Revision 3, February.

IT Corporation, 2000a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, March.

IT Corporation (IT), 2000b, *Final Human Health and Ecological Screening Values and PAH Background Summary Report, Fort McClellan, Calhoun County, Alabama*, July.

IT Corporation, 1998, *Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama*, prepared for the U.S. Army Corps of Engineers, Mobile District, August.

Science Applications International Corporation, 1998, *Final Background Metals Survey Report, Fort McClellan, Alabama*, July.

Shaw Environmental, Inc. (Shaw), 2005, *Letter Work Plan for Investigation of AWWSB Tank Sites Near BBGR Ranges*, July.

Shaw Environmental, Inc. (Shaw), 2004, *Draft Remedial Investigation Report, Baby Bains Gap Road Ranges, Fort McClellan, Calhoun County, Alabama*, August.

U.S. Army Corps of Engineers (USACE), 2001, *Archives Search Report, Maps, Fort McClellan, Anniston, Alabama*, Revision 1, September.

TABLES

Table 1

**XRF Sample Locations and Survey Coordinates
AWWSB Tank Sites at BBGR Ranges
Fort McClellan, Alabama**

Bains Gap Road Tank Site - 34 Locations		
Grid Node	Northing	Easting
NW100,SW200	1167468.21	677766.68
NW100,SW300	1167396.34	677697.23
NW200,SW100	1167609.71	677764.07
NW200,SW200	1167537.66	677694.63
NW200,SW300	1167465.61	677625.36
NW200,SW400	1167393.73	677556.09
NW300,SW100	1167679.15	677692.20
NW300,SW200	1167607.28	677622.76
NW300,SW300	1167535.23	677553.31
NW300,SW400	1167463.18	677484.04
NW400,SW100	1167748.59	677620.15
NW400,SW200	1167676.37	677550.71
NW400,SW300	1167604.32	677481.09
NW400,SW400	1167532.45	677411.82
NW500,SW100	1167817.87	677548.10
NW500,SW200	1167745.99	677478.66
NW500,SW300	1167673.94	677409.21
NW500,SW400	1167602.07	677339.94
NW600,SW100	1167887.48	677476.05
NW600,SW200	1167815.43	677406.78
NW600,SW300	1167743.39	677337.16
NW600,SW400	1167671.34	677267.89
NW700,SW100	1167956.75	677404.01
NW700,SW200	1167884.71	677334.56
NW700,SW300	1167812.83	677265.29
NW700,SW400	1167740.78	677195.85
NW800,SW100	1168026.03	677331.96
NW800,SW200	1167954.15	677262.69
NW800,SW300	1167882.10	677193.41
NW800,SW400	1167810.05	677123.80
NW900,SW100	1168095.47	677260.08
NW900,SW200	1168023.42	677190.81
NW900,SW300	1167951.55	677121.37
NW900,SW400	1167879.32	677051.92

Snap Lane Tank Site - 30 Locations		
Grid Node	Northing	Easting
N0,W100	1163863.80	675670.42
N100,W100	1163959.11	675639.69
N100,W200	1163928.38	675544.90
N200,W100	1164054.42	675609.13
N200,W200	1164023.52	675514.00
N200,W300	1163992.79	675418.51
N300,W100	1164149.39	675578.41
N300,W200	1164118.83	675483.27
N300,W300	1164087.93	675388.13
N300,W400	1164057.37	675292.82
N400,W100	1164244.70	675547.68
N400,W200	1164214.14	675452.54
N400,W300	1164183.24	675357.22
N400,W400	1164152.69	675262.09
N500,W100	1164339.84	675517.12
N500,W200	1164308.94	675421.98
N500,W300	1164278.55	675326.67
N500,W400	1164247.65	675231.36
N600,W100	1164434.80	675486.39
N600,W200	1164404.42	675391.08
N600,W300	1164373.52	675295.94
N600,W400	1164342.96	675200.63
N700,W100	1164530.12	675455.49
N700,W200	1164499.39	675360.52
N700,W300	1164468.83	675265.21
N700,W400	1164438.10	675169.90
N800,W100	1164625.43	675424.76
N800,W200	1164594.70	675329.79
N800,W300	1164563.80	675234.66
N800,W400	1164533.07	675139.34

Table 2

**Confirmation Soil Samples
AWWSB Tank Sites at BBGR Ranges
Fort McClellan, Alabama**

Sample Designation ^a	Sample No.	QA/QC Samples		Analytical Parameter
		Field Duplicates	MS/MSD	
BG(NW800,SW300)-SS-SU0001-XRF	SU0001			TAL Metals
BG(NW200,SW200)-SS-SU0002-XRF	SU0002			TAL Metals
BG(NW600,SW400)-SS-SU0003-XRF	SU0003			TAL Metals
BG(NW300,SW400)-SS-SU0004-XRF	SU0004		BG(NW300,SW400)-SS-SU0004-MS/MSD	TAL Metals
Snap(N500, W300)-SS-SU0005-XRF	SU0005	Snap(N500, W300)-SS-SU0006-FD		TAL Metals
Snap(N100, W200)-SS-SU0007-XRF	SU0007			TAL Metals
Snap(N800, W100)-SS-SU0008-XRF	SU0008			TAL Metals

^a Samples collected from upper 3 inches of soil at the grid node locations indicated in parentheses.

BG - Bains Gap Road Tank Site.

FD - Field duplicate.

MS/MSD - Matrix spike/matrix spike duplicate.

QA/QC - Quality assurance/quality control.

Snap - Snap Lane Tank Site.

SS - Surface soil.

TAL - Target analyte list. Samples analyzed using EPA Method 6010B.

Table 3

XRF Results
AWWSB Tank Sites at BBGR Ranges
Fort McClellan, Alabama

Bains Gap Road Tank Site - 34 Locations			
Grid Node	Sample Date	XRF Result (mg/kg)	
		Lead	Copper
NW100,SW200	17-Aug-05	32.7	<LOD (55)
NW100,SW300	15-Aug-05	<LOD (16)	<LOD (60)
NW200,SW100	17-Aug-05	49.9	<LOD (47)
NW200,SW200	17-Aug-05	41.5	<LOD (45)
NW200,SW300	15-Aug-05	<LOD (15)	<LOD (53)
NW200,SW400	15-Aug-05	16.4	<LOD (46)
NW300,SW100	17-Aug-05	36.9	<LOD (45)
NW300,SW200	17-Aug-05	30.4	<LOD (49)
NW300,SW300	15-Aug-05	28.8	<LOD (48)
NW300,SW400	15-Aug-05	14.8	<LOD (45)
NW400,SW100	17-Aug-05	24.3	<LOD (48)
NW400,SW200	17-Aug-05	25.7	<LOD (56)
NW400,SW300	15-Aug-05	22.8	<LOD (53)
NW400,SW400	15-Aug-05	33.1	<LOD (63)
NW500,SW100	17-Aug-05	20.6	<LOD (51)
NW500,SW200	17-Aug-05	15	<LOD (46)
NW500,SW300	15-Aug-05	<LOD (16)	<LOD (65)
NW500,SW400	15-Aug-05	18.1	<LOD (45)
NW600,SW100	16-Aug-05	15.1	<LOD (37)
NW600,SW200	16-Aug-05	33.3	<LOD (57)
NW600,SW300	15-Aug-05	<LOD (13)	<LOD (53)
NW600,SW400	15-Aug-05	24.7	<LOD (50)
NW700,SW100	16-Aug-05	41.9	<LOD (43)
NW700,SW200	16-Aug-05	<LOD (16)	<LOD (62)
NW700,SW300	15-Aug-05	<LOD (15)	<LOD (52)
NW700,SW400	15-Aug-05	<LOD (13)	<LOD (46)
NW800,SW100	16-Aug-05	<LOD (15)	<LOD (54)
NW800,SW200	16-Aug-05	45.6	<LOD (48)
NW800,SW300	16-Aug-05	57.2	<LOD (49)
NW800,SW400	15-Aug-05	27.1	<LOD (43)
NW900,SW100	16-Aug-05	42.6	<LOD (50)
NW900,SW200	16-Aug-05	26.5	<LOD (44)
NW900,SW300	16-Aug-05	34.8	<LOD (50)
NW900,SW400	15-Aug-05	29.6	<LOD (51)

Snap Lane Tank Site - 30 Locations			
Grid Node	Sample Date	XRF Result (mg/kg)	
		Lead	Copper
N0,W100	11-Aug-05	20.6	<LOD (63)
N100,W100	11-Aug-05	24.9	<LOD (53)
N100,W200	11-Aug-05	29.1	<LOD (52)
N200,W100	11-Aug-05	19.5	<LOD (62)
N200,W200	11-Aug-05	26.1	<LOD (56)
N200,W300	11-Aug-05	55	<LOD (61)
N300,W100	11-Aug-05	51.6	<LOD (64)
N300,W200	11-Aug-05	32.6	<LOD (54)
N300,W300	11-Aug-05	25.4	<LOD (50)
N300,W400	11-Aug-05	32.6	<LOD (54)
N400,W100	8-Aug-05	27.4	<LOD (44)
N400,W200	8-Aug-05	23.6	<LOD (59)
N400,W300	8-Aug-05	38.9	<LOD (49)
N400,W400	8-Aug-05	26.6	<LOD (57)
N500,W100	8-Aug-05	27.4	<LOD (44)
N500,W200	8-Aug-05	25.7	<LOD (53)
N500,W300	8-Aug-05	65.3	<LOD (53)
N500,W400	8-Aug-05	19.4	<LOD (54)
N600,W100	8-Aug-05	24.2	<LOD (56)
N600,W200	8-Aug-05	<LOD (14)	<LOD (47)
N600,W300	8-Aug-05	32.9	<LOD (51)
N600,W400	8-Aug-05	15.9	<LOD (49)
N700,W100	8-Aug-05	<LOD (18)	<LOD (63)
N700,W200	8-Aug-05	<LOD (15)	<LOD (56)
N700,W300	8-Aug-05	20.9	<LOD (46)
N700,W400	8-Aug-05	23.8	<LOD (56)
N800,W100	8-Aug-05	15.6	<LOD (56)
N800,W200	8-Aug-05	27.9	<LOD (58)
N800,W300	8-Aug-05	17.6	<LOD (48)
N800,W400	8-Aug-05	<LOD (14)	<LOD (51)

Bold entries are sample locations selected for offsite confirmation analysis.

mg/kg - Milligrams per kilogram.

<LOD - Less than the limit of detection listed in parentheses.

XRF - X-ray fluorescence.

Table 4

**Confirmation Sample Results for Lead and Copper
AWWSB Tank Sites Near BBGR Ranges
Fort McClellan, Alabama**

Sample Location	Sample Number	Lead Concentration (mg/kg)				Copper Concentration (mg/kg)		
		XRF (Field) ^a	XRF (Prep) ^b	EMAX ^c		XRF (Field) ^a	XRF (Prep) ^b	EMAX ^c
BG(NW800,SW300)	SU0001	57.2	77.2	82.6		<49	<47	10.2
BG(NW200,SW200)	SU0002	41.5	54.3	59.7		<45	<49	10.9
BG(NW600,SW400)	SU0003	24.7	33.9	36.5		<50	<49	8.3
BG(NW300,SW400)	SU0004	14.8	21.8	24.8		<45	<47	5.1
Snap(N500, W300)	SU0005	65.3	71.3	81.8		<53.4	<48	7.3
Snap(N100, W200)	SU0007	29.1	19.0	24.2		<52	<49	6.6
Snap(N800, W100)	SU0008	15.6	<15	22.6		<57	<55	8.5

^a XRF (Field) - surface soil sample was collected and analyzed directly in the field using XRF.

^b XRF (Prep) - sample was prepared by drying, crushing, and sieving prior to XRF analysis.

^c EMAX - EMAX Laboratories, Inc. Prepared sample analyzed for TAL metals using EPA Method 6010B.

BG - Bains Gap Road Tank Site.

mg/kg - milligrams per kilogram.

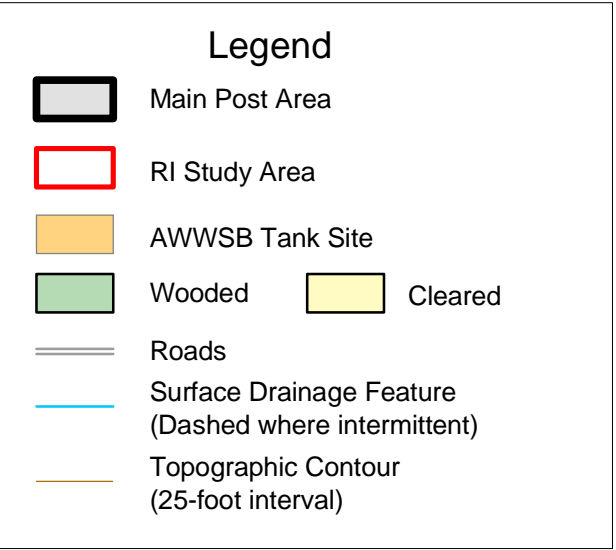
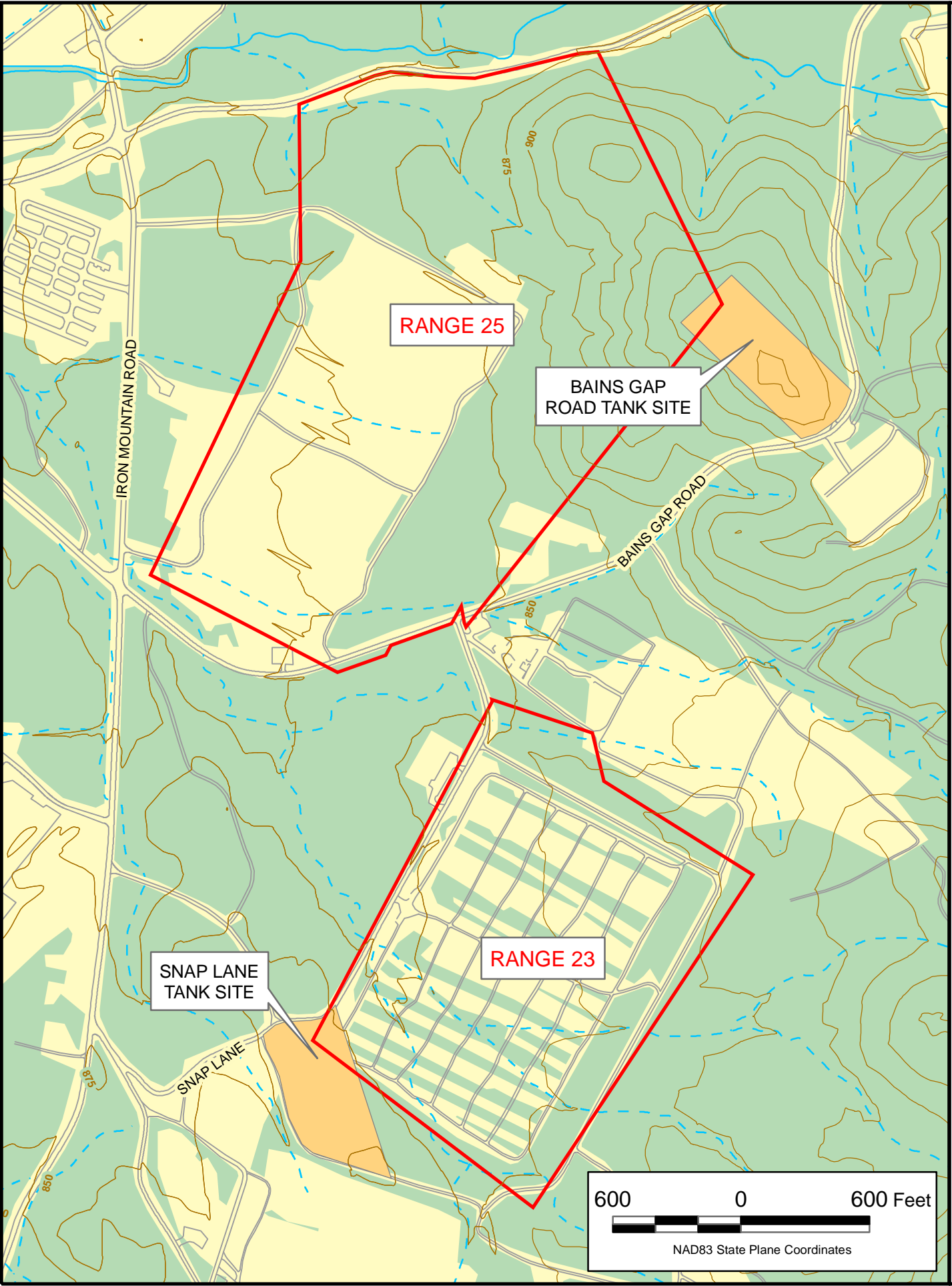
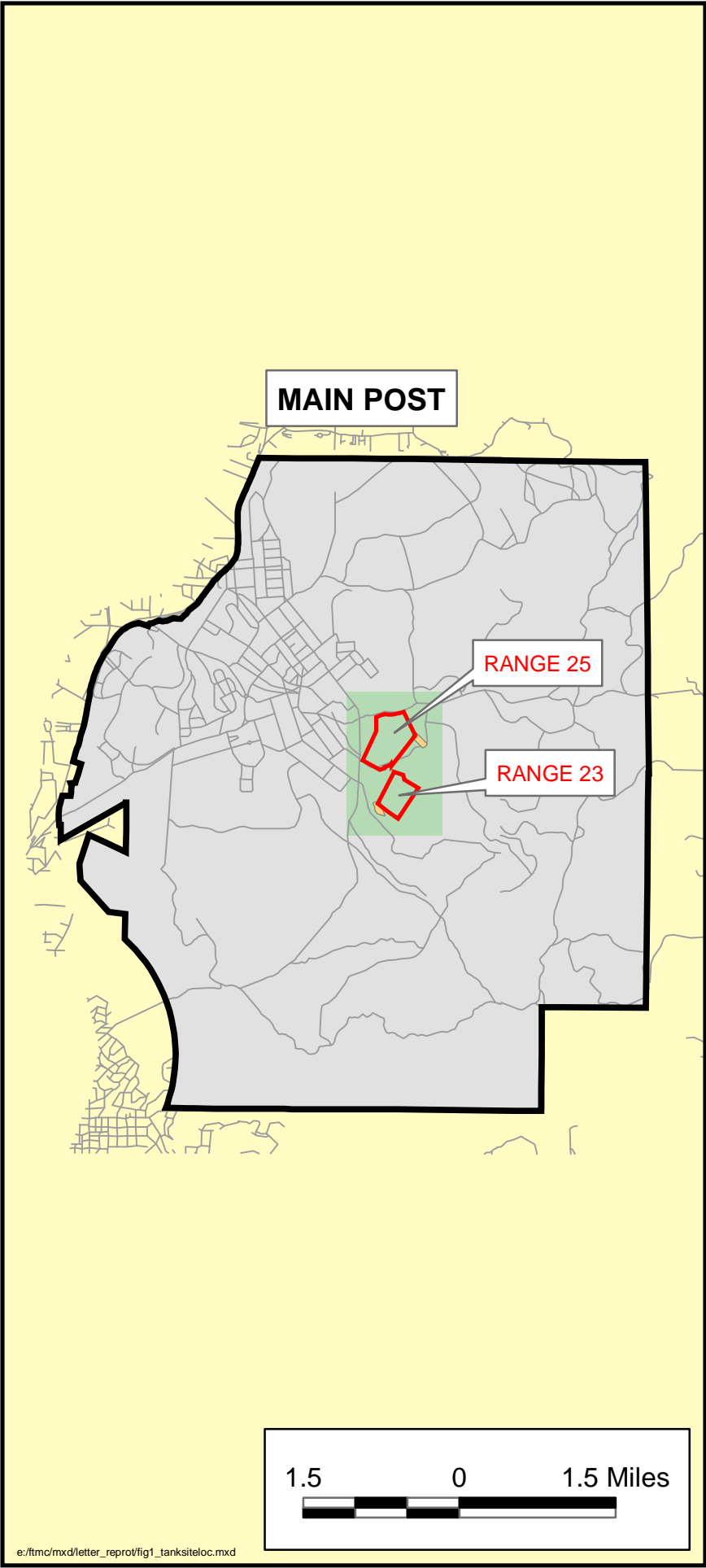
Snap - Snap Lane Tank Site.

FIGURES

Figure 1

Locations of AWWSB Tank Sites at the BBGR Ranges

Fort McClellan, Alabama



Shaw Shaw Environmental, Inc.



Contract No. DACA21-96-D-0018



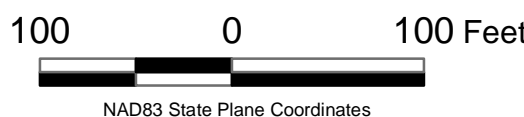
Figure 2

XRF Grid Sample Locations Bains Gap Road Tank Site

Fort McClellan, Alabama

Legend

RI Study Area

AWWSB Tank Site

 Shaw Environmental, Inc.



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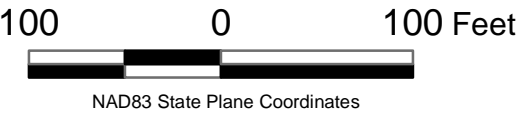
Figure 3

XRF Grid Sample Locations Snap Lane Tank Site

Fort McClellan, Alabama

Legend

-  RI Study Area
-  AWWSB Tank Site
-  Sample Grid
-  XRF Sample Location



 Shaw Environmental, Inc.



Contract No. DACA21-96-D-0018

APPENDIX A

XRF RESULTS AND CALIBRATION FORMS

XRF Summary of Results

AWWSB Tank Sites at Baby Bains Gap Road Ranges

Location ID		Sampling Data		Prep			XRF Data		Conc (ppm)					Split to EMAX	Other Comments
Sample ID	²⁰⁰⁵ Date	Time	Pan	Lab	Frag?	Read No.	Count (sec)	Pb	Std	Cu	Std	Other Metals			
Bains Gap Road Tank Site															
NW900, SW400	8-15	1045	X			ND	#7	142	29.6	±10		<51			
NW800, SW400	8-15	1100	X			ND	#8	121	27.1	±9.7		<43			
NW800, SW400	8-15	1115	X			ND	#9	127	<13			<46			
NW600, SW400	8-15	1130	X			ND	#10	121	24.7	±11		<50			
NW500, SW400	8-15	1150	X			ND	#11	121	18.1	±8.9		<45			
NW400, SW400	8-15	1355	X			ND	#12	130	33.1	±13		<63			
NW300, SW400	8-15	1410	X			ND	#13	121	14.8	±8.9		<45			
NW200, SW400	8-15	1420	X			ND	#14	121	16.4	±9.2		<46			
NW200, SW300	8-15	1450	X			ND	#16	121	<15			<53			
NW100, SW300	8-15	1435	X			ND	#15	128	<16			<60			
NW300, SW300	8-15	1505	X			ND	#17	121	28.8	±9.9		<48			
NW400, SW300	8-15	1520	X			ND	#18	121	22.8	±11		<53		SAND (OPEN AREA)	
NW500, SW300	8-15	1535	X			ND	#19	122	<16			<65		SAND	
NW600, SW300	8-15	1555	X			ND	#20	121	<13			<53		SAND	
NW700, SW300	8-15	1405	X			ND	#21	121	<15			<52		SAND	

XRF Summary of Results

AWWSB Tank Sites at Baby Bains Gap Road Ranges

[illegible]

XRF Summary of Results

AWWSB Tank Sites at Baby Bains Gap Road Ranges

[illegible]

XRF Summary of Results
AWWSB Tank Sites at Baby Bains Gap Road Ranges

Location ID	Sampling Data		Prep			XRF Data		Conc (ppm)					Split to	Other
Grid Node	Date	Time	Pan	Lab	Frag?	Read No.	Count (sec)	Pb	Std	Cu	Std	Other Metals	EMAX	Comments
Snap Lane Tank Site														
N800, W100	8-8	0925	X		NO	#6	134	15.6	±10	<57				R23 ADJ. TO DR. 1.46WAD
N700, W100	8-8	0935	X		NO	#7	122	<18		<63			R23	FL #18 NEAR POINT
N600, W100	8-8	0955	X		NO	#8	122	24.2	±11	<56			R23	FL #16 ~ 50' moved
N500, W100	8-8	1005	X		NO	#9	126	27.4	±9.4	<44			R23	FL #16 ~ 50' moved
N400, W100	8-8	1020	X		NO	#10	133	31.7	±11	<54				
N400, W200	8-8	1030	X		NO	#11	121	23.6	±12					
N500, W200	8-8	1045	X		NO	#12	122	25.7	±11					
N600, W200	8-8	1100	X		NO	#13	123	<14						
N700, W200	8-8	1115	X		NO	#14	121	<15				As 20.7 ± 13	R23	FL #16 BEHIND POINT
N800, W100	8-8	1125	X		NO	#15	129	27.9	±12					
N800, W300	8-8	1350	X		NO	#16	122	17.6	±9.6					
N700, W300	8-8	1400	X		NO	#17	121	20.9	±9.7					
N600, W300	8-8	1420	X		NO	#18	153	32.9	±11					
N500, W300	8-8	1430	X		NO	#19	122	65.3	±14					
N400, W300	8-8	1445	X		NO	#20	123	38.9	±11					
N400, W400	8-8	1500	X		NO	#21	123	26.6	±11					
N500, W400	8-8	1510	X		NO	#22	122	19.4	±11					
N600, W400	8-8	1525	X		NO	#23	124	15.9	±9.8					
N700, W400	8-8	1535	X		NO	#24	122	23.8	±11					
N800, W400	8-8	1545	X		NO	#25	121	<14						

XRF Summary of Results

AWWSB Tank Sites at Baby Bains Gap Road Ranges

[illegible]

XRF Summary of Results

Awwsb Tank Sites at Baby Bains Gap Road Ranges

[illegible]

XRF CALIBRATION FORMS



Shaw Environmental & Infrastructure, Inc.

Page 1 of

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:Date: 8-8-05 Check XRF clock.

Is XRF warm-up

Time: 0800 Agree?>15 min? Yes No

Yes No

Internal calibration complete?

Yes NoComments: none

Record energy resolution:

377

eV

Source Strength: N/A mCi**2. Start-of-Day Calibration:**

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

☒ X

Cd-109

☐ NA

Fe-55

☐ NA

Am-241

Blank - SiO ₂ , Count: <u>121</u> sec # <u>2</u>			
Element	Conc (ppm)		< DLs Accept?
	Certified	Detected	
Pb	<25	<u><12</u>	<u>40%</u> ↓
Cu	<50	<u><42</u>	
Ni	<70	<u><57</u>	

Other metals: Zn (<40) <26, As (<30) <14,Hg (<35) <9.6, Cr (<300) <110

Moderate Lead-NIST 2711, Count: <u>121</u> sec # <u>4</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	1,162	<u>1010 ± 46</u>	<u>14%</u> <u>yes</u> ↓
Cu	114	<u><76</u>	
Ni	<70	<u>150 ± 89</u>	

Other metals: Zn (350.4) 313, As (105) 154,Hg (<35) <19, Cr (<300) 466

Low Lead-NIST 2586, Count: <u>121</u> sec # <u>3</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	432	<u>336 ± 29</u>	<u>25%</u> <u>yes</u> ↓
Cu	81 *	<u><77</u>	
Ni	75 *	<u><160</u>	

Other metals: Zn (352) 347, As (18.9) <47,Hg (<35) <9.6, Cr (301) 923

High Lead-NIST 2710, Count: <u>180</u> sec # <u>5</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	5,532	<u>5020 ± 100</u>	<u>9.7%</u> <u>yes</u> ↓
Cu	2,950	<u>2220 ± 140</u>	
Ni	14.3	<u><180</u>	

Other metals: Zn (6,952) 6760, As (626) 962 ± 98,Hg (32.6) <36, Cr (<300) 516 ± 300

Comments: * Not a NIST certified value.



Shaw Environmental & Infrastructure, Inc.

Page 1 of 1

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:Date: 8-10-05 Check XRF clock.

Is XRF warm-up

Time: 0700 Agree?>15 min? Yes NoYes No

Internal calibration complete?

Yes NoComments: NONE

Record energy resolution:

373 eVSource Strength: N/A mCi**2. Start-of-Day Calibration:**

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

☒ X

Cd-109

☐ NA

Fe-55

☐ NA

Am-241

Blank - SiO ₂ , Count: <u>122</u> sec # <u>2</u>			
Element	Conc (ppm)		< DLs Accept?
	Certified	Detected	

Pb	< 25	< 12	yes
Cu	< 50	< 12 <u>492</u> min 8-10	↓
Ni	< 70	< 57	↓

Other metals: Zn (<40) < 27, As (<30) < 13Hg (<35) < 9.9, Cr (<300) < 100

Moderate Lead-NIST 2711, Count: <u>121</u> sec # <u>4</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	1,162	1010 ± 46	14% yes
Cu	114	< 75	↓
Ni	< 70	< 130	↓

Other metals: Zn (350.4) 338 ± 40 As (105) 198 ± 49Hg (<35) < 19, Cr (<300) 599 ± 170

Low Lead-NIST 2586, Count: <u>123</u> sec # <u>3</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	432	363 ± 29	17% yes
Cu	81 *	< 80	↓
Ni	75 *	323 ± 120	↓

Other metals: Zn (352) 324, As (18.9) 49.7 ± 31Hg (<35) < 16, Cr (301) 1060

High Lead-NIST 2710, Count: <u>122</u> sec # <u>5</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	5,532	4990 ± 130	10% yes
Cu	2,950	2220 ± 170	28% ↓
Ni	14.3	< 220	↓

Other metals: Zn (6,952) 6980, As (626) 983 ± 120Hg (32.6) < 42, Cr (<300) < 520

Comments: * Not a NIST certified value.



Shaw Environmental & Infrastructure, Inc.

Page 1 of 1

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:

Is XRF warm-up

>15 min? Yes NoDate: 8-11-05

Check XRF clock.

Time: 0900

Agree?

Yes No

Internal calibration complete?

Yes NoComments: NONE

Record energy resolution:

374 eVSource Strength: N/A mCi**2. Start-of-Day Calibration:**

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

X

Cd-109

NA

Fe-55

NA

Am-241

Blank - SiO ₂ , Count: <u>121</u> sec <u>#24</u>			
Element	Conc (ppm)		< DLs Accept?
	Certified	Detected	
Pb	< 25	<u>< 8.1</u> < 11	<u>YES</u>
Cu	< 50	<u>< 43</u>	
Ni	< 70	<u>50 ± 28</u>	<u>< 60</u>

Other metals: Zn (227) < 18, As (30) < 14Hg (35) < 63, Cr (300) < 75 < 110

Moderate Lead-NIST 2711, Count: <u>122</u> sec <u>#6</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	1,162	<u>1110 ± 49</u>	<u>4.6% YES</u>
Cu	114	<u>99.1 ± 52</u>	<u>14%</u>
Ni	< 70	<u>< 130</u>	

Other metals: Zn (350.4) 335 ± 41 As (105) 102 ± 50Hg (35) < 21, Cr (300) < 270

Low Lead-NIST 2586, Count: <u>121</u> sec <u>#5</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	432	<u>425 ± 33</u>	<u>1.6% YES</u>
Cu	81 *	<u>< 84</u>	
Ni	75 *	<u>< 180</u>	

Other metals: Zn (352) 307 ± 24 As (18.9) < 51Hg (35) < 17, Cr (301) < 390

High Lead-NIST 2710, Count: <u>121</u> sec <u>#7</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	5,532	<u>5470 ± 140</u>	<u>1.1% YES</u>
Cu	2,950	<u>3080 ± 190</u>	<u>4.3%</u>
Ni	14.3	<u>< 220</u>	

Other metals: Zn (6,952) 7030 ± 200 As (626) 825 ± 130Hg (32.6) < 49, Cr (300) < 570

Comments: * Not a NIST certified value.



Shaw Environmental & Infrastructure, Inc.

Page ____ of ____

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:Date: 8-15-05

Check XRF clock.

Is XRF warm-up

Time: 0715

Agree?

>15 min? Yes NoYes No

Internal calibration complete?

Yes NoComments: none

Record energy resolution:

377

eV

Source Strength:

NR

mCi

2. Start-of-Day Calibration:

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

☒ X

Cd-109

☐ NA

Fe-55

☐ NA

Am-241

Blank - SiO ₂ , Count: <u>121</u> sec <u>#3</u>			
Element	Conc (ppm)		< DLs Accept?
	Certified	Detected	
Pb	< 25	< 12	YES
Cu	< 50	< 45	↓
Ni	< 70	< 61	↓

Other metals: Zn (<40) <27, As (<30) <13Hg(<35) 49.3, Cr (<300) 110

Moderate Lead-NIST 2711, Count: <u>121</u> sec <u>#5</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	1,162	991 ± 45	16% YES
Cu	114	43	↓
Ni	< 70	140 ± 86	↓

Other metals: Zn (350.4) 324, As (105) 178 ± 48Hg (<35) 119, Cr (<300) 435 ± 17

Low Lead-NIST 2586, Count: <u>274</u> sec <u>#4</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	432	369 ± 20	9% YES
Cu	81 *	< 54	↓
Ni	75 *	301 ± 79	↓

Other metals: Zn (352) 322 ± 27, As (18.9) 431Hg(<35) 111, Cr (301) 941

High Lead-NIST 2710, Count: <u>121</u> sec <u>#6</u>			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	
Pb	5,532	5040 ± 130	9.3% YES
Cu	2,950	2550 ± 180	15% ↓
Ni	14.3	< 220	↓

Other metals: Zn(6,952) 7010, As (626) 1080Hg(32.6) 444, Cr (<300) <550

Comments: * Not a NIST certified value.

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:

Is XRF warm-up

>15 min? Yes No

Date: 08-16-05

Check XRF clock.

Time: 0755

Agree?

Yes No

Internal calibration complete?

Yes No

Comments: None

Record energy resolution:

377 eV

Source Strength: N/A mCi

2. Start-of-Day Calibration:

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

☒ X

Cd-109

☐ NA

Fe-55

☐ NA

Am-241

Blank - SiO₂, Count: 187 sec # 2

Element	Conc (ppm)		< DLs Accept?
	Certified	Detected	

Pb	< 25	< 9.1	<u>Yes</u> ↓
Cu	< 50	< 35	
Ni	< 70	< 49	

Other metals: Zn (<40) < 21, As (<30) < 11E,

Hg (<35) < 7.8, Cr (<300) < 89

Moderate Lead-NIST 2711, Count: 122 sec # 4

Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	1,162	1140 ± 49	<u>1.9% Yes</u> <u>37%</u>
Cu	114	78.4 ± 51	
Ni	< 70	< 130	

Other metals: Zn (350.4) 289 ± 89, As (105) 101 ± 51

Hg (<35) < 21, Cr (<300) < 270

Low Lead-NIST 2586, Count: 122 sec # 3

Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	432	385 ± 31	<u>12% Yes</u> ↓
Cu	81 *	< 80	
Ni	75 *	< 180	

Other metals: Zn (352) 283, As (18.9) < 49

Hg (<35) < 17, Cr (301) < 370

High Lead-NIST 2710, Count: 122 sec # 5

Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	5,532	5490 ± 140	<u>< 1% Yes</u> <u>1.3%</u> ↓
Cu	2,950	2910 ± 180	
Ni	14.3	< 220	

Other metals: Zn (6,952) 6720, As (626) 834 ± 120

Hg (32.6) < 48, Cr (<300) < 580

Comments: * Not a NIST certified value.

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:

Is XRF warm-up

>15 min? Yes No

Date: 8-17-05

Check XRF clock.

Time: 0730

Agree?

Yes No

Internal calibration complete?

Yes No

Comments: N/A

Record energy resolution:

373 eV

Source Strength: N/A mCi

2. Start-of-Day Calibration:

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

☒ X

Cd-109

☐ NA

Fe-55

☐ NA

Am-241

Blank - SiO ₂ , Count: <u>122</u> sec #2			
Element	Conc (ppm)		< DLs Accept?
	Certified	Detected	

Pb	< 25	< 11	Yes
Cu	< 50	< 42	↓
Ni	< 70	65.6 ± 40	↓

Other metals: Zn (<40) < 26, As (<30) < 13

Hg(<35) < 10, Cr (<300) < 100

Low Lead-NIST 2586, Count: <u>121</u> sec #3			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	432	398 ± 30	8.2% Yes
Cu	81 *	< 81	↓
Ni	75 *	234 ± 120	↓

Other metals: Zn (352) 328, As (18.9) < 48

Hg(<35) < 16, Cr (301) 793 ± 230

Comments: * Not a NIST certified value.

Moderate Lead-NIST 2711, Count: <u>121</u> sec #4			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	1,162	1050 ± 47	10% Yes
Cu	114	< 76	↓
Ni	< 70	160 ± 89	↓

Other metals: Zn (350.4) 292 ± 39, As (105) 133 ± 49

Hg (<35) < 19, Cr (<300) 322

High Lead-NIST 2710, Count: <u>122</u> sec #5			
Element	Conc (ppm)		% RPD Accept?
	Certified	Detected	

Pb	5,532	5000 ± 130	10% Yes
Cu	2,950	2270 ± 170	26% ↓
Ni	14.3	< 210	↓

Other metals: Zn(6,952) 6910, As (626) 1080 ± 120

Hg(32.6) < 540, Cr (<300) < 540

XRF Calibration Form

City of Anniston WWSB Tank Sites at Baby Bains Gap Road Ranges

Project No: 796887

Cost Code: 15120200

1. Initial Calibration Data:

Is XRF warm-up

>15 min?

Yes

No

Date: 8-18-05

Check XRF clock.

Time: 1435

Agree?

Yes

No

Internal calibration complete?

Yes

No

Comments:

NONE

Record energy resolution:

374

eV

Source Strength:

N/A

mCi

2. Start-of-Day Calibration:

Note: Cd-109 will be used for Pb, Cu calibration; Am-241 will be used for Sb.

Sources Used (check all that apply):

X

Cd-109

NA

Fe-55

NA

Am-241

Blank - SiO ₂ , Count: 122 sec #2			
Element	Conc (ppm)		< DLs
	Certified	Detected	

Pb	< 25	< 12	YES
Cu	< 50	< 44	↓
Ni	< 70	< 61	↓

Other metals: Zn (<40) 22, As (<30) 14,

Hg (<35) 9.7, Cr (<300) 110

Low Lead-NIST 2586, Count: 121 sec #3			
Element	Conc (ppm)		% RPD
	Certified	Detected	

Pb	432	406 ± 31	6.2 YES
Cu	81 *	< 82	↓
Ni	75 *	< 82 < 160	↓

Other metals: Zn (352) 333, As (18.9) ,

Hg (<35) 17, Cr (301) 370

Comments: * Not a NIST certified value.

Moderate Lead-NIST 2711, Count: 121 sec #4			
Element	Conc (ppm)		% RPD
	Certified	Detected	

Pb	1,162	1120 ± 48	3.7% YES
Cu	114	87.3 ± 51	26% ↓
Ni	< 70	< 130	↓

Other metals: Zn (350.4) 324, As (105) 79.8 ± 50

Hg (<35) 20, Cr (<300) 270

High Lead-NIST 2710, Count: 121 sec #5			
Element	Conc (ppm)		% RPD
	Certified	Detected	

Pb	5,532	5130 ± 130	7.5% YES
Cu	2,950	2900 ± 180	1.7% ↓
Ni	14.3	< 210	↓

Other metals: Zn (6,952) 6350, As (626) 768 ± 120

Hg (32.6) 46, Cr (<300) 550

APPENDIX B

**SAMPLE COLLECTION LOGS AND
ANALYSIS REQUEST/CHAIN-OF-CUSTODY RECORDS**



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/16/2005

Location Code: Bains Gap Road Site

Collection Time: 10:05

Sample Number: SU0001

Start Depth: N/A 0' nm 9-30

Sample Name: BG(NW800, SW300)-SS-SU0001-XRF

End Depth: N/A 0.5' BUS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE REPORT Figure.

Comments: XRF Pb: 57.2 ppm

Logged BY/Date:

WFS 9-30-05

Reviewed BY/Date:

J. Winton 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/17/2005

Location Code: Bains Gap Road Site

Collection Time: 13:51

Sample Number: SU0002

Start Depth: ~~N/A~~ 0' Aug 9-30

Sample Name: BG(NW200, SW200)-SS-SU0002-XRF

End Depth: ~~N/A~~ 0.5' BGS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE REPORT FIGURE.

Comments: XRF Pb: 41.5 ppm

Logged BY/Date:

[Signature] 9-30-05

Reviewed BY/Date:

[Signature] 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/15/2005

Location Code: Bains Gap Road Site

Collection Time: 11:30

Sample Number: SU0003

Start Depth: N/A 0 Run 9-30

Sample Name: BG(NW600, SW400)-SS-SU0003-XRF

End Depth: N/A 0.5' BGS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE REPORT FIGURE

Comments: XRF Pb: 24.7 ppm

Logged BY/Date:

WJF 9-30-05

Reviewed BY/Date:

J. Winters 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/15/2005

Location Code: Bains Gap Road Site

Collection Time: 14:11

Sample Number: SU0004

Start Depth: N/A 0' 9-30-05

Sample Name: BG(NW300, SW400)-SS-SU0004-XRF

End Depth: N/A 0.5' BLS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REPORT FIGURE.

Comments: XRF Pb: 14.8 ppm

Logged BY/Date:

9-30-05

Reviewed BY/Date:

10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/15/2005

Location Code: Bains Gap Road Site

Collection Time: 14:11

Sample Number: SU0004-MS

Start Depth: N/A 0 m 9-30

Sample Name: BG(NW300, SW400)-MS-SS-SU0004-MS

End Depth: N/A 0.5' 1265

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REPT. FINDINGS.

Comments: XRF Pb: 14.8 ppm

Logged BY/Date:

[Signature] 9-30-05

Reviewed BY/Date:

[Signature] 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/15/2005

Location Code: Bains Gap Road Site

Collection Time: 14:11

Sample Number: SU0004-MSD

Start Depth: N/A 0' 1' 1m 9-30

Sample Name: BG(NW300, SW400)-MS-SS-SU0004-MSD

End Depth: N/A 0.5' BGS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REPORT FIGURES

Comments: XRF Pb: 14.8 ppm

Logged BY/Date:

[Signature] 9-30-05

Reviewed BY/Date:

[Signature] 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/8/2005

Location Code: Snap Lane Site

Collection Time: 13:37

Sample Number: SU0005

Start Depth: N/A 0' 1-30

Sample Name: Snap(N500, W300)-SS-SU0005-XRF

End Depth: N/A 0.5' BGS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REPORT FIGURES -

Comments: XRF Pb: 65.3 ppm

Logged BY/Date:

[Signature] 9-30-05

Reviewed BY/Date:

[Signature] 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/8/2005

Location Code: Snap Lane Site

Collection Time: 13:37

Sample Number: SU0006

Start Depth: N/A 0' 7-30

Sample Name: Snap(N500, W300)-SS-SU0006-FD

End Depth: N/A 0.5' 805

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REPORT FIG.

Comments: XRF Pb: 65.3 ppm

Logged BY/Date:

WFE/ly 9-30-05

Reviewed BY/Date:

J. Gray Winter 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/11/2005

Location Code: Snap Lane Site

Collection Time: 13:54

Sample Number: SU0007

Start Depth: N/A 0' PM 7-30

Sample Name: Snap(N100, W200)-SS-SU0007-XRF

End Depth: N/A 0.5' FR BXS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REPT FIG.

Comments: XRF Pb: 29.1 ppm

Logged BY/Date:

AWG 9-30-05

Reviewed BY/Date:

J. Troy Winton 10/3/05



Shaw Environmental & Infrastructure, Inc.

Sample Collection Log

Project: 796887 Fort McClellan, SAD TERC

Manager: Moran, Steve G

RFA/COC Number: TANK-081805

Site: AWWSB Tank Sites

Collection Date: 8/8/2005

Location Code: Snap Lane Site

Collection Time: 9:29

Sample Number: SU0008

Start Depth: N/A 0' Aug-20

Sample Name: Snap(N800, W100)-SS-SU0008-XRF

End Depth: N/A 0.5' FT BGS

Sampling Method: Hand Trowel/XRF Pan Prep

Sample Team: R. McBride

Check	Analytical Suite	Qty	Size	Units	Type	TCLP (Y/N)
	TAL Metals	1	4	oz	CWM	N

Site Sketch:

SEE FINAL REP FIG.

Comments: XRF Pb: 15.6 ppm

Logged BY/Date:

WJF 9-30-05

Reviewed BY/Date:

Greg Winter 10/3/05



Shaw Environmental & Infrastructure, Inc.

ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD

REFERENCE COC NO.: TANK-081805

PAGE 1 OF 2

Bill To: Shaw Environmental

Accounts Payable

312 Directors Drive

Knoxville, TN 37923

Report To: Shaw Environmental

Randy McBride

312 Directors Drive

Knoxville, TN 37923

Project Name/No: Fort McClellan 796887

Sample Team Member: R. McBride

Profit Center:

Project Manager: Moran, Steve G

Purchase Order No.:

Required Report Date: Normal

Sample Shipment Date: 08-18-2005

Laboratory Destination: EMAX

Laboratory Contact: Joe Kelbley

Project Contact/Phone: R. McBride 865-705-7412

Carrier Waybill No.: UPS 1Z.66V.539.01.

Sample Number	Sample Type/Description	Date/Time Collected	Container Type	Sample Volume	Pre-servative	Requested Testing Program	Condition on Receipt	Disposal Record
1. SU0001	BG(NW800, SW300)-SS-SU0001-XRF	8/16/05 10:05	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		
2. SU0002	BG(NW200, SW200)-SS-SU0002-XRF	8/17/05 13:51	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		
3. SU0003	BG(NW600, SW400)-SS-SU0003-XRF	8/15/05 11:30	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		
4. SU0004	Remove MS/MSD from same container.	BG(NW300, SW400)-SS-SU0004-XRF	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		
5. SU0004-MS/MSD	BG(NW300, SW400)-MS-SS-SU0004-MS	8/15/05 14:11						
6. SU0005	Snap(N500, W300)-SS-SU0005-XRF	8/8/05 13:37	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		
7. SU0006	Snap(N500, W300)-SS-SU0006-FD	8/8/05 13:37	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		
8. SU0007	Snap(N100, W200)-SS-SU0007-XRF	8/11/05 13:54	4 oz CWM	4 oz	Cool 4 deg C	TAL Metals by 6010B/7000		

Special Instructions:

Possible Hazard Identification: Use caution when handling.

Non-haz:

Flammable:

Poison B:

Unknown: ☒

Sample Disposal:

Return to Client:

Disposal by Lab: ☒

Archive:

Turnaround Time:

Normal: ☒

Rush:

Level of QC Required:

I.

II.

III.

Project Specific: ☒

1. Relinquished by: R.L. McBride, Shaw Environmental

Date: 8-18-05

Time: 1455

1. Received by:

Date: 08.19.05

Time: 10:00

2. Relinquished by:

Date:

Time:

2. Received by:

Date:

Time:

3. Relinquished by:

Date:

Time:

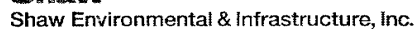
3. Received by:

Date:

Time:

Comments: If samples not received in good condition contact Randy McBride at 865-705-7412.

T=3.6°C



ANALYSIS REQUEST AND CHAIN-OF-CUSTODY RECORD (Cont.)

PAGE 2 OF 2

Project Name/No.: Fort McClellan 796887

Laboratory Destination: EMAX

Sample Shipment Date: 08-18-2005

[illegible]

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APPENDIX C

SUMMARY OF VALIDATED ANALYTICAL DATA

Summary of Validated Analytical Data
AWWSB Tank Sites at Baby Bains Gap Road Ranges
Fort McClellan, Alabama

(Page 1 of 2)

Sample Location Sample No. Sample Date Sample Depth (feet)			BG(NW800,SW300) SU0001 16-Aug-05 0 - 0.5			BG(NW200,SW200) SU0002 17-Aug-05 0 - 0.5			BG(NW600,SW400) SU0003 15-Aug-05 0 - 0.5			BG(NW300,SW400) SU0004 15-Aug-05 0 - 0.5		
METALS (SW846 Methods 6010B/7471A)	Parameter	Units	Result	Qual	VQual	Result	Qual	VQual	Result	Qual	VQual	Result	Qual	VQual
	Aluminum	mg/kg	8850		J	5700		J	6650		J	5180		J
	Antimony	mg/kg	13.1	U	UJ	12.9	U	UJ	11.8	U	UJ	13.2	U	UJ
	Arsenic	mg/kg	2.39			1.13	J	B	1.94			2.02		
	Barium	mg/kg	317			257			163			78.5		
	Beryllium	mg/kg	0.826	J	J	0.425	J	J	0.655	J	J	0.428	J	J
	Cadmium	mg/kg	0.187	J	J	0.21	J	J	0.132	J	J	0.143	J	J
	Calcium	mg/kg	1800			908			108	J	J	650		
	Chromium	mg/kg	7.01			5.91			8.2			5.41		
	Cobalt	mg/kg	6.34			1.38	J	J	9.04			9.59		
	Copper	mg/kg	10.2			10.9			8.28			5.07		
	Iron	mg/kg	9030			5930			9160			7200		
	Lead	mg/kg	82.6			59.7			36.5			24.8		
	Magnesium	mg/kg	759			664			501			660		
	Manganese	mg/kg	1030			48.4			201			417		
	Mercury	mg/kg	0.131			0.154			0.0492	J	J	0.0621	J	J
	Nickel	mg/kg	7.82			4.22			6.48			6.36		
	Potassium	mg/kg	640	J	J	408	J	J	499	J	J	448	J	J
	Selenium	mg/kg	1.31	U	U	0.905	J	J	0.904	J	B	0.849	J	B
	Silver	mg/kg	2.61	U	U	2.58	U	U	2.35	U	U	2.63	U	U
	Sodium	mg/kg	41.4	J	J	33.5	J	J	40.7	J	J	37.8	J	J
	Thallium	mg/kg	2.92		B	3.04		B	3.87		B	3.57		B
	Vanadium	mg/kg	11.1			9.58			11			10		
	Zinc	mg/kg	56.4		J	32.8		J	36.1		J	29.3		J

Summary of Validated Analytical Data
AWWSB Tank Sites at Baby Bains Gap Road Ranges
Fort McClellan, Alabama

(Page 2 of 2)

Sample Location Sample No. Sample Date Sample Depth (feet)			SNAP(N500,W300) SU0005 8-Aug-05 0 - 0.5			SNAP(N500,W300) SU0006 8-Aug-05 0 - 0.5			SNAP(N100,W200) SU0007 11-Aug-05 0 - 0.5			SNAP(N800,W100) SU0008 8-Aug-05 0 - 0.5		
METALS (SW846 Methods 6010B/7471A)	Parameter	Units	Result	Qual	VQual	Result	Qual	VQual	Result	Qual	VQual	Result	Qual	VQual
	Aluminum	mg/kg	11300		J	10200		J	4910		J	11600		J
	Antimony	mg/kg	12	U	UJ	12	U	UJ	13.2	U	UJ	11.7	U	UJ
	Arsenic	mg/kg	3.01			2.32			1.78			2.1		
	Barium	mg/kg	78.6			76			32.5			80.3		
	Beryllium	mg/kg	0.638	J	J	0.557	J	J	1.32	U	U	0.589	J	J
	Cadmium	mg/kg	1.2	U	U	1.2	U	U	1.32	U	U	1.17	U	U
	Calcium	mg/kg	260			303			1060			891		
	Chromium	mg/kg	13.3			14.6			19.2			13.4		
	Cobalt	mg/kg	7.73			7.55			2.7			8.47		
	Copper	mg/kg	7.34			7.28			6.62			8.49		
	Iron	mg/kg	10200			9660			8580			16100		
	Lead	mg/kg	81.8			84.5			24.2			22.6		
	Magnesium	mg/kg	325			293			246			505		
	Manganese	mg/kg	1210			1180			181			534		
	Mercury	mg/kg	0.053	J	J	0.0636	J	J	0.0572	J	J	0.0695	J	J
	Nickel	mg/kg	6.03			5.4			2.62	J	J	7.74		
	Potassium	mg/kg	255	J	J	234	J	J	165	J	J	474	J	J
	Selenium	mg/kg	1.2	U	U	0.674	J	B	1.32	U	U	1.17	U	U
	Silver	mg/kg	2.39	U	U	2.39	U	U	2.64	U	U	2.34	U	U
	Sodium	mg/kg	23.4	J	J	30.2	J	J	17.7	J	B	21	J	J
	Thallium	mg/kg	2.22	J	B	2.75		B	4.05		B	7.15		
	Vanadium	mg/kg	19.8			18.8			13			22.7		
	Zinc	mg/kg	25.6		J	24.7		J	29.6		J	29.6		J

B - Constituent also detected in method blank sample.

J - Estimated value.

mg/kg - milligrams per kilogram.

U - Constituent not detected above reporting limit listed.

Qual - Laboratory data qualifier.

VQual - Validation data qualifier.

RESPONSE TO COMMENTS

**Response to ADEM Comments on the
Site Investigation Report for AWWSB Tank Sites Near Baby Bains Gap Road Ranges
Fort McClellan, Alabama (dated October 6, 2005)**

Comments from Stephen A. Cobb, Chief, Hazardous Waste Branch, Land Division, dated February 6, 2006.

General Comments

The Alabama Department of Environmental Management (ADEM or the Department) has reviewed Fort McClellan's *Site Investigation for AWWSB Tank Sites*. The Army conducted this investigation in order to facilitate transfer of these properties to the Joint Powers Authority (JPA).

The Department concurs with the overall content of the document. However, ADEM requests clarification on two lead sample results at the Snap Lane Tank Site. On Page 5 of the text, the table indicates the lab lead result at the N100,W200 sample location was 84.5 mg/kg. The same value is presented in Table 4, but listed as Sample Number SU0007. However, in Appendix C - Summary of Validated Analytical Data, a different value for SU0007, 24.2 mg/kg, is listed. Please clarify or revise. Also, Sample Number SU0008 is listed in Appendix C as 22.6 mg/kg, but in Table 4 as 24.2 mg/kg. Please clarify or revise.

Response: The lead concentrations presented in Appendix C are correct in both cases. The text and tables were corrected to match the data presented in Appendix C.

EPA APPROVAL LETTER



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

November 3, 2005

EMAIL & US MAIL

4WD-FFB

Ron Levy
BRAC Environmental Coordinator
U.S. Army Transition Force, Fort McClellan
P.O. Box 5022
Anniston, AL 36205-5000

SUBJ: SI Report for AWWSB Tank Sites Near Baby Bains Gap Road Ranges
Fort McClellan

Dear Mr. Levy:

The Environmental Protection Agency (EPA) has reviewed the subject document and agrees with it as written. Therefore, EPA approves the subject document. If you have any questions, please call me at (404) 562-8549.

Sincerely,

A handwritten signature in cursive script that reads "Doyle T. Brittain".

Doyle T. Brittain
Senior Remedial Project Manager

cc: Lisa Holstein, Ft. McClellan
Michael Kelly, US Army AEC
Shana Decker, ADEM
Brandi Little, ADEM
Lee Coker, USA/COE
Steve Moran, Shaw Environmental
Daniel Copeland, CEHNC-OE-DC
Bernie Case, ALANG
Miki Schneider, JPA
Wayne Sartwell, ALANG
Pete Tuttle, USF&WS